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THE PROGNOSIS OF GALL-BLADDER INFECTIONS.

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It is well in discussing any phase of surgery of the bile passages to have in mind that practically all lesions for which surgical interference is required have their origin in infections of the mucous membrane by microörganisms. The one condition for which we most frequently operate is gall-stones, and as Sir Berkeley Moynihan so tersely expresses it, "Every gall-stone is a monument erected to the evil memory of the germ which lies buried within it." Even malignant disease of the gall-bladder, if primary, in nearly all instances has its determining cause in irritation and ulceration caused by gall-stones which themselves are the result of infection. There can therefore be no question that a microbic infection is the starting-point of nearly all the diseases of the gall-bladder for which we operate, but the type of organism, except in the acute infections or the acute stage of the infections, plays little part in the prognosis.

The colon bacillus is by far the most frequent cause of the infection, and then the typhoid bacillus, the staphylococcus, and the streptococcus in the order named.

Acute cholecystitis, especially that due to the typhoid bacillus and occurring during or shortly after typhoid, is liable under proper treatment, to subside without operation, and only requires operation when there is not in a day or two a prompt subsidence of all the symptoms. The acute cholecystitis which is preceded by a history of gall-bladder symptoms extending over a considerable period of time will certainly require operation during or after the attack, and in these cases the prognosis is grave if the operation is delayed in the presence of marked and continuing symptoms of sepsis, especially if jaundice is present. The gall-bladder, when acutely infected or in an acute exacerbation of a chronic infection behaves very much as does the appendix, and the prognosis is about the same in each, excepting, of course, a perforative peritonitis is not so likely in the gall-bladder cases; but gangrene, perforation by stones of the gall-bladder and intestinal walls, acute infection of the bile ducts and the pancreas and occasionally a general peritonitis may result. I am convinced that in the majority of instances the primary infection of the gall-bladder does not give rise to the symptoms of acute cholecystitis, but that the infection occurs insidiously and the supposedly acute infection is often as a matter of fact an acute exacerbation of an old infection, due to interference with the emptying of the gall-bladder by a stone. The cases of acute cholecystitis which are not apt to subside, and which rapidly pass on to gangrene and peritonitis, are those due to the staphylococcus and the streptococcus or to complete occlusion of the cystic duct by a stone. Some of the worst cases of acute cholecystitis I have operated upon have been those in which no stone was present, but an acute infection by one of these organisms. The symptoms of severe septic infection are very marked in these cases, and if drainage of the gall-bladder is not done promptly, before the infection extends to the ducts and the liver, the prognosis is very grave. If jaundice is present it indicates a blocking of the hepatic or common duct by edema, and should add greatly to the gravity of the prognosis. If drainage is established early the prognosis is remarkably good, and if it is done late, even after gangrene has occurred, but before a general cholangitis has developed, it is not bad. It is astounding how patients recover after operations which reveal an extensive gangrenous condition of the gall-bladder and how grave the condition becomes when there is an obstruction to the flow of bile through the liver and ducts, as indicated by jaundice. I am now speaking of the acute infections without stones. When the obstruction to the flow of bile is due to the lodgment of a stone or stones which can be removed through an incision in the common duct and free drainage established the outlook is quite favorable, even in very sick patients.

As a basis for this paper I have studied my last 200 operations on the gall-bladder and ducts and have divided them into two series of 100 each. At first I thought 100 cases would be enough from which to draw conclusions, but later determined to go back over another 100 for verification and comparison of my conclusions. No case has been omitted because the lesion was not in the gall-bladder or ducts, and therefore in the list are a number of cases of cancer of the head of the pancreas and two of cancer of the stomach complicated by gall-stones. The inclusion of these cases greatly increased the operative mortality. We have also included in the mortality list a number of cases in which death did not occur for three or four months, and was due only indirectly to the operation.

So far as the cases of acute cholecystitis, in which operation was done during the height of the attack, are concerned there is no difference in the two series. In the 200 cases there were 8 cases without stone and 2 deaths, each due to septicemia, and 35 cases with stone and 10 deaths. The causes of death in these varied greatly: One was from acute hemorrhagic pancreatitis, present at the time of operation; 1 from hemorrhage from the gall-bladder and ducts two weeks after operation; 1 from suppurating pancreatitis four months after operation; 1 from pulmonary embolism three months after operation and following a thrombophlebitis of the saphenous vein; 1 from abscess of the liver and of the spleen present at the time of operation; 2 from septicemia; 1 from cirrhosis of the liver; 1 from cholangitis; 1 from acute endocarditis. These deaths comprise nearly one-half of the total number in both series of cases, and in most instances might have been prognosticated at the conclusion of the operation.

It must be apparent that an acute cholecystitis which does not promptly subside under treatment or which is characterized by severe symptoms of general infection and especially by jaundice is a very serious condition and demands prompt operation, which should comprise free drainage of the biliary tract. The cases of common duct infection, especially those in which we find the duct filled with a muddy sand which must be scooped out with a spoon, I think are the most serious cases we see excepting those complicated by an acute hemorrhagic pancreatitis. In looking over these fatal cases I have been impressed with the fact that the majority of them have been private cases and not ward cases, and that in nearly all of them there was ample warrant for operation long before the acute exacerbation of the infection occurred.

In the 200 cases cancer of the gall-bladder was found in 8 cases, and it was apparently primary in 7 of these. In but 1 case could a radical operation be done, and in this case a section of the liver was removed with the gall-bladder. The patient is alive and well today, more than four years after operation. In one of the fatal cases I was uncertain whether an obstruction of the duodenum was due to cancer or syphilis. Cancer of the pancreas was found in 4 cases; cancer of the ampulla in 1 case and cancer of the stomach (with gall-stones) in 2 cases. In these 14 malignant cases there were 11 deaths. It is apparent then that cancer of the gall-bladder or of the pancreas carries with it a high operative mortality. Another observation of practical value is that gall-stones were responsible for nearly all the cases of primary cancer of the gall-bladder. Having accounted for 23 deaths, 12 in the acute septic cases (most of them having a cholangitis), and 11 in cases complicated by malignancy, I find 5 deaths unassigned; 1 was due to pulmonary embolism in a case of cholecystectomy; 1 to subdiaphragmatic abscess following choledochostomy; 2 to pneumonia, and 1 to complete suppression of urine.

One naturally asks whether the type of operation influences the prognosis, and I can say definitely that simple drainage of the gall-bladder in the hands of most operators is somewhat safer than cholecystectomy or the operations involving the opening of the common duct or the duodenum; but when these operations are plainly indicated simple drainage of the gall-bladder will not in most instances save the patient or relieve him of his symptoms. In my last 100 cases I have removed the gall-bladder fifty-three times and in the previous 100 cases it was removed but eleven times. In reviewing the two series I cannot discover any difference in the mortality. In the 200 cases the common duct was opened and stones removed nineteen times and the duodenum opened twice to facilitate the removal of a stone from the ampulla. In nearly all the malignant cases no operation on the gall-bladder or ducts was done.

The prognosis as to the recurrence of gall-stones is an interesting one, and my own experience leads me to believe that a true recurrence is very rare. I have operated a second time upon four of my patients for stone. In one I found a stone in the common duct which I believe was overlooked at the first operation two years previous when I had removed a great many stones from the gall-bladder and seven from the common duct. In another operated upon seven years after the first operation because of an intermittent biliary fistula I found one small stone; at the first operation the patient was very ill from a suppurating cholecystitis and cholangitis, and I had removed about 200 stones from the gall-bladder. I am rather inclined to think in this case a tiny stone was probably overlooked in the cystic duct. The third case was that of a physician who developed a recurrence of his symptoms about three years after his first operation, when I had removed 70 stones from the gall-bladder. I thought that in this case that again I might have overlooked a stone, but when I reopened the gall-bladder I found 25 soft mulberry stones, undoubtedly of recent formation. In the fourth case at the first operation I could feel no stones in the gall-bladder which appeared normal, and I did not open it. I attributed the symptoms to a band of adhesion extending from the pylorus to the abdominal wall. Three and a half years later at the second operation I found a single gall-stone. In this case it is quite possible that the stone may have been present at the first operation. In the last 3 cases the gall-bladder was removed at the second operation. All of these cases are not included in the list of 200 under consideration, but they comprise my entire personal experience with secondary operation for stone. In but 1 case, therefore, have I seen an undoubted redevelopment of gall-stones following a primary operation for stone. This experience, I think, answers very well a query which is constantly put by the patient.

A rather interesting fact which is shown by a study of these 200 cases is that the danger of hemorrhage during and after operation on patients deeply jaundiced is practically eliminated by the prophylactic injections of horse serum. Although scores of these patients had been deeply jaundiced for varying periods of time and the coagulation time greatly reduced, there was but one death from hemorrhage, a continuous oozing from the mucous membrane. Coagulation tests are very necessary in jaundiced patients in order properly to estimate the risk of operation.

The opening and drainage of the common duct when indicated by the presence of a stone not only does not add to the risk of the operation, but if carefully carried out reduces it. The passage of inflexible probes into the ducts to ascertain if the obstruction has been entirely removed is dangerous; flushing the ducts with sterile water is a much safer method. It is much safer to open the duct than to crush the stone or forcibly push it up into the cystic duct or gall-bladder. When a stone is wedged in the ampulla it is often better to remove it through an incision in the duodenum than through the duct.

In conclusion, I would say that the mortality in gall-bladder infections depends very largely upon whether or not a cholangitis is present and that a persistent jaundice accompanied by general symptoms of sepsis is of grave import and calls for prompt drainage through the gall-bladder or common duct, or both; that a patient having undoubted symptoms of gall-bladder infection should not be allowed to postpone operation until an acute exacerbation of the infection occurs; that even far-advanced and neglected cases of infection of the gall-bladder alone give good results following operation; that jaundice due to stone in the common duct in the absence of symptoms of sepsis is not necessarily a grave symptom if prompt operation is done; that the high mortality following operations occurs in the cases of long-standing gall-bladder symptoms with acute exacerbation of the infection and in cases of malignancy of the gall-bladder and pancreas; that the use of horse serum has practically eliminated the danger of hemorrhage due to long-standing jaundice; that the recurrence of gall-stones after thorough operation is extremely rare; and finally, that more is to be learned from the study of our failures than our successes.